MATERIAL DATA SHEET

STEEL GRADE

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OVAKO

27MnCrB5-2 All

General Information

WR-Steel®

(Wear resistant) WR-steel, stands for wear-resistant steel. This group of steel includes a broad range of grades with a wide range of hardness levels 350 – 650 HV, dimensions and steel grades designed to give you a wear-resistant advantage when making product exposed to a high degree of wear and where service life is important. WR-steels are characterised by consistent properties and cost effectiveness due to optimized alloy content for different end applications.

For additional Heat Treatment Data, please visit the Heat Treatment Guide.

Similar designations

27MnCrB5-2, 28MnCrB5-2, 29MnCrB5-2, BCM 311

Chemical composition

Variant	Cast	Di	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ti %	Al %	B %
SB28M13CB (SB9667)	CC	2.4	CEV 0.62_{max}	Min	0.28	0.15	1.10	-	-	0.25	-	-	0.0020
			Pcm 0.41_{max}	Max	0.33	0.40	1.50	0.030	0.030	0.60	-	-	0.0050
SB27M12CB (SB9660)	CC		CEV 0.58_{max}	Min	0.25	0.15	1.00	-	-	0.30	-	-	0.0010
			Pcm 0.39_{max}	Max	0.30	0.35	1.40	0.035	0.035	0.60	-	0.040	0.0060
SB28M12CB (SB9652)	CC		CEV 0.6_{max}	Min	0.24	0.10	1.10	-	-	0.30	0.020	-	0.0008
			Pcm 0.4_{max}	Max	0.30	0.40	1.30	0.035	0.035	0.60	0.050	-	0.0050
5465 (BCM311)	CC		CEV 0.58_{max}	Min	0.24	-	1.10	-	-	0.30	-	-	0.0008
			Pcm 0.39_{max}	Max	0.30	0.40	1.40	0.025	0.035	0.60	-	-	0.0050
27MnCrB5-2 EN ISO 683-2	Std		CEV 0.58_{max}	Min	0.24	-	1.10	-	-	0.30	-	-	0.0008
			Pcm 0.39_{max}	Max	0.30	0.40	1.40	0.025	0.035	0.60	-	-	0.0050

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A_5 [%]	Reduction of area Z_{min} [%]	Hardness	Impact (ISO-V) $strength_{min}$
SB28M13CB (SB9667)	+QT	All formats	14 typical	880	950-1025	12	45	-	-
	+AR	Flat bar	5 < 20	530**	775 typical	17	-	< 275 HB	-
		Flat bar	5 < 20	-	-	-	-	250 HB typical	-
		Flat bar	20 < 70	430**	650-730	17	-	< 265 HB	-
		Flat bar	20 < 70	-	-	-	-	215 HB typical	-
SB28M12CB (SB9652)	+AR	Flat bar	15 < 60	-	-	-	-	< 240 HB	-
5465 (BCM311)	+AR	Round bar	< 90	-	-	-	-	< 250 HB	-
	+QW	Round bar	70 typical	850	1050-1300	10	45	33-41 HRC	20 °C 30 J (long)
	+QT	Round bar	70 typical	700	800-1000	14	55	22-31 HRC	20 °C 70 J (long)

*$Rp_{0.2}$ * R_{eh}, ** R_{el}*

BCM 311 +QT tempered at 500°C

Transformation temperatures

	Temperature °C
MS	382
AC1	720
AC3	786

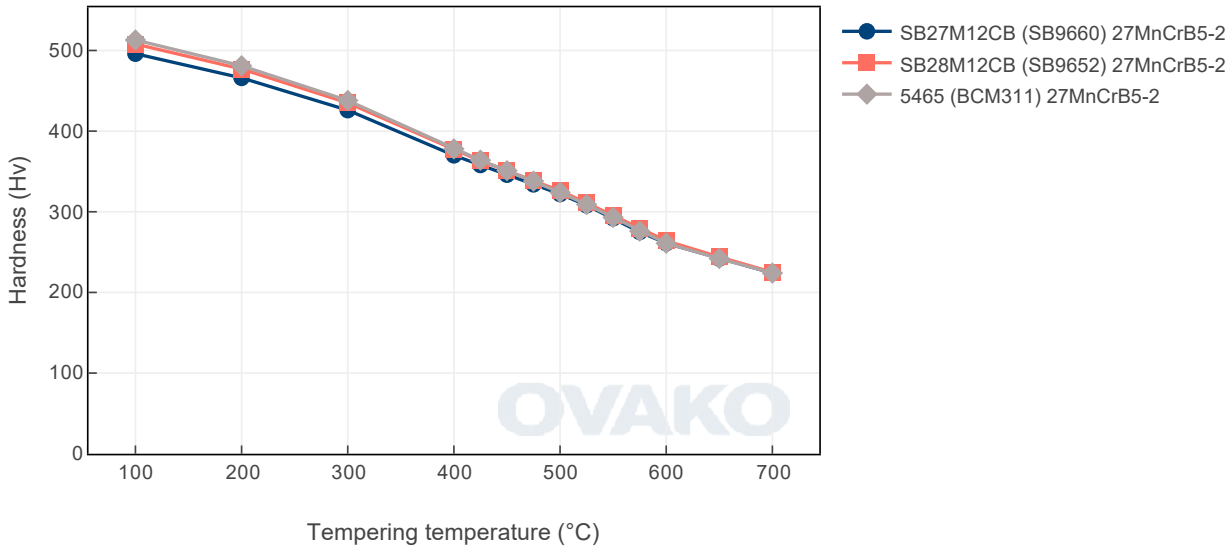
Heat treatment recommendations

Treatment	Condition	Temperature cycle	Cooling/quenching
Quench & Tempering	+QT	880 - 910 °C	in water or oil

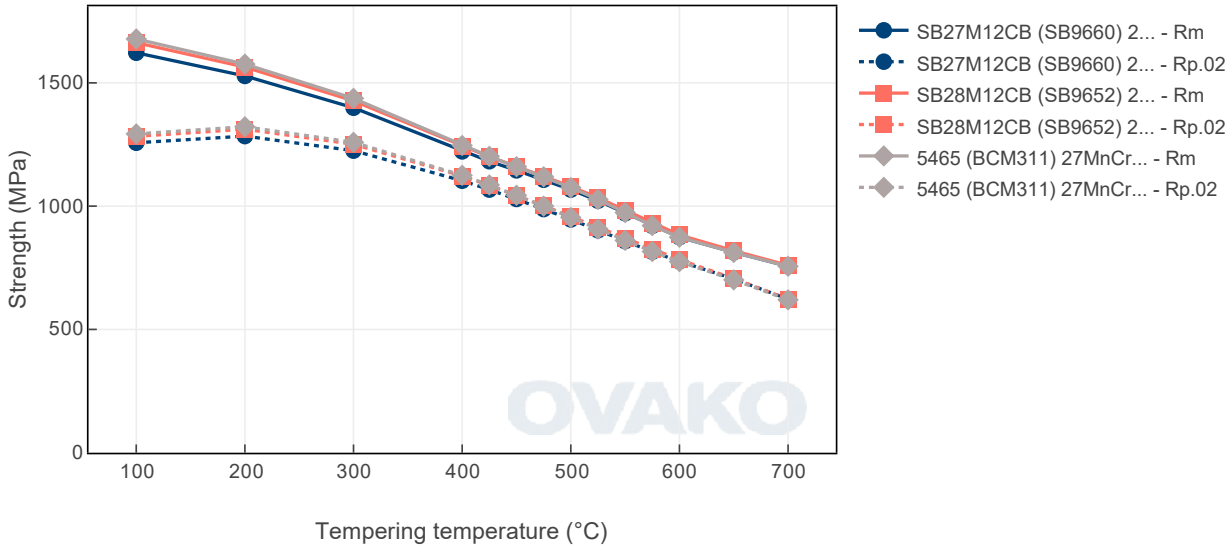
Heat Treatment Guide generated Graphs

The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.

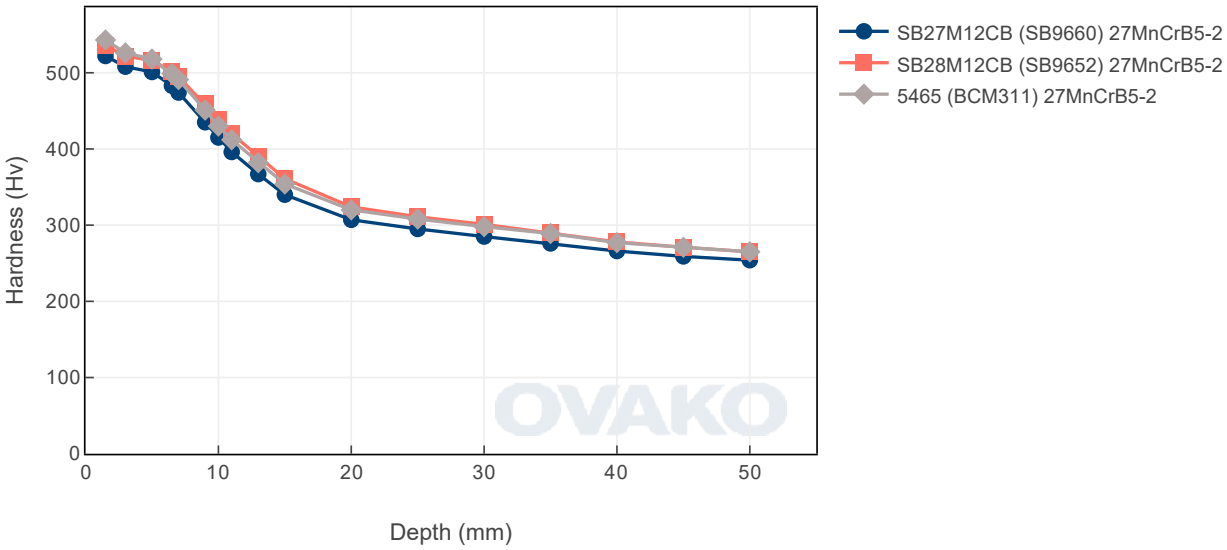
Tempering Diagram (hardness)



Tempering Diagram (strength)



Jominy


Hardness (Hv)
500
400
300
200
100
0
0
10
20
30
40
50
Depth (mm)
SB27M12CB (SB9660) 27MnCrB5-2
SB28M12CB (SB9652) 27MnCrB5-2
5465 (BCM311) 27MnCrB5-2
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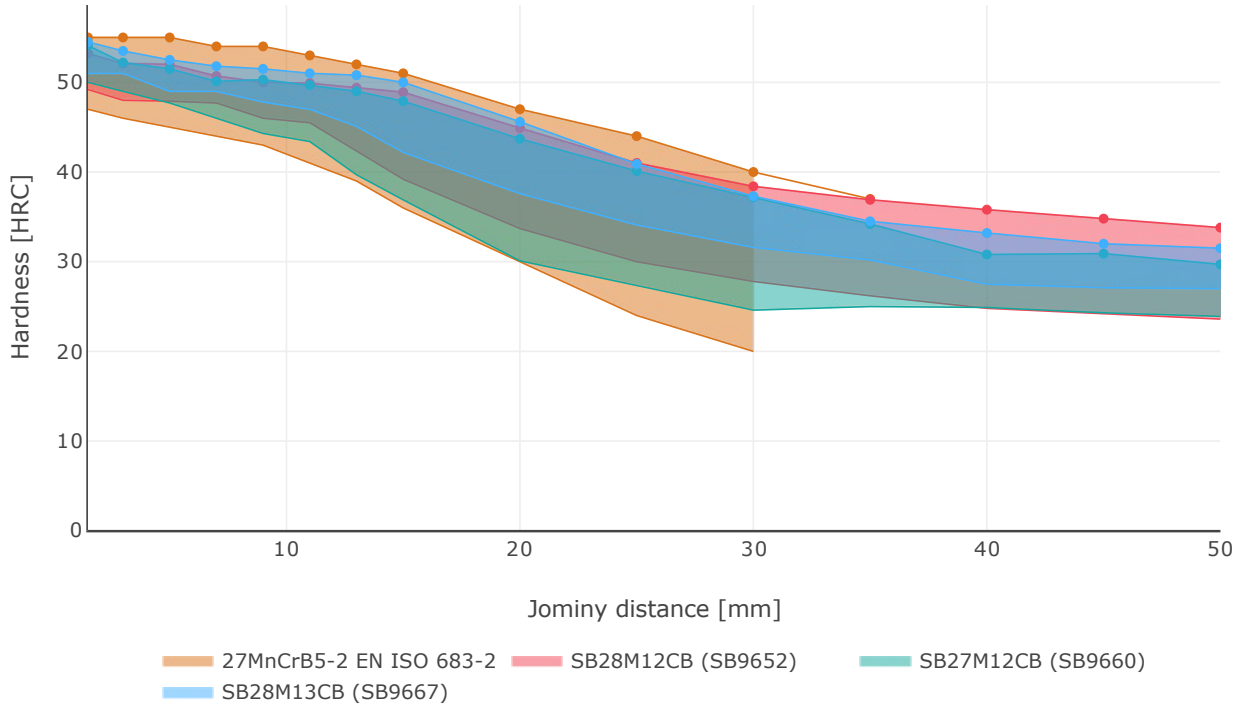
Hardenability



SUSTAINABILITY-ENVIRONMENTAL IMPACT DATA

At Ovako sustainability and reduction of our environmental impact is a major focus in everything we do.
Further information is found here.

Steel works	Hofors	Smedjebacken	Imatra
CO2e/kg	120	62	76

To get the full picture of our products environmental impact we have to look at all of our CO_2 emission sources.
Not only the steel work Scope 1-2 itself, but all operations downstream in our production, heating and heat treatment furnaces etc (full scope 1-2) as well as all the emission from input material, eg. alloys, scope 3.

Steel Grade	Format	Condition	Scope 1-3 (CO2e kg /1000 kg steel)
SB27M12CB (SB9660)	Flat bar	+AR	513
SB29M13CB (SB9667)	Flat bar	+AR	408
SB28M12CB (SB9652)	Flat bar	+AR	410
5465 (BCM311)	Round bar	+AR	494

All above data are to be seen as typical values for the specified format and condition. Detailed information about your specific product please contact your sales contact.

Other properties (typical values)

Youngs module (GPa)	Poisson´s ratio (-)	Shear module (GPa)	Density (kg/m3)
210	0.3	80	7800
Average CTE 20-300°C (µm/m°K)	Specific heat capacity 50/100°C (J/kg °K)	Thermal conductivity Ambient temperature (W/m°K)	Electrical resistivityAmbient temperature (µΩm)
12	460 - 480	40 - 45	0.20 - 0.25

Contact us

Would you like to know more about our offers? Don´t hesitate to contact us:

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For more detailed information please visit http://www.ovako.com/en/Contact-Ovako/